

**Cybernet**

System 700

CA-700

**Service Manual**

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Specifications

Power output.	70W/channel, rated minimum sine wave RMS into 8 Ohm load over 20 to 20,000 Hz, both channels driven.	Bass	±10 dB at 100 Hz.
		Midrange	±6 dB at 1 kHz.
		Treble	±10 dB at 10 kHz.
		Filterage.	
		Low	30 Hz (–12 dB/oct.).
		High	7 kHz (–12 dB/oct.).
		Loudness contour.	+7 dB at 100 Hz, +3.5 dB at 10 kHz.
		Tape recording output level.	150 mV.
		Power consumption.	530 Watt.
		Power supply.	220V 50 Hz AC.
		Dimensions.	
		Width	420 mm.
		Depth	430 mm.
		Height	100 mm.
Total harmonic distortion.	0.02%.		
Dynamic head room.	1.4 dB.		
SMPTE intermodulation distortion.	0.02%.		
Damping factor.	50 at 1 kHz into 8 Ohm.		
Load impedance.			
A or B	4 to 16 Ohm.		
A + B	8 to 16 Ohm.		
Frequency response.	20 to 20,000 Hz at +0, –0.5 dB.		
Phono RIAA tolerance.	±0.5 dB.		
Input sensitivity.			
Phono MM	0.3 mV (2.5 mV IHF '66).		
Phono MC	12 microvolt (100 microvolt IHF '66).		
Others	18 mV (150 mV IHF '66).		
Microphone	0.12 mV (1 mV IHF '66) 10 kOhm.		
S/N.			
Phono MM	77 dB (88 dB IHF '66) 47 kOhm.		
Phono MC	77 dB (68 dB IHF '66) 47 Ohm.		
Others	80 dB (100 dB IHF '66) 47 kOhm.		
Phono overload.			
Phono MM	220 mV (250 mV 1 kHz).		
Phono MC	8.4 mV (10 mV 1 kHz).		
Tone control range.			

Instruction Information

Features

The Cybernet model CA-700 is a high fidelity integrated stereo amplifier designed to be incorporated with other System 700-series components — the stereo digital tuner model CT-700S and the stereo cassette deck model CCD-700 — into a complete stereo system. It features the following:

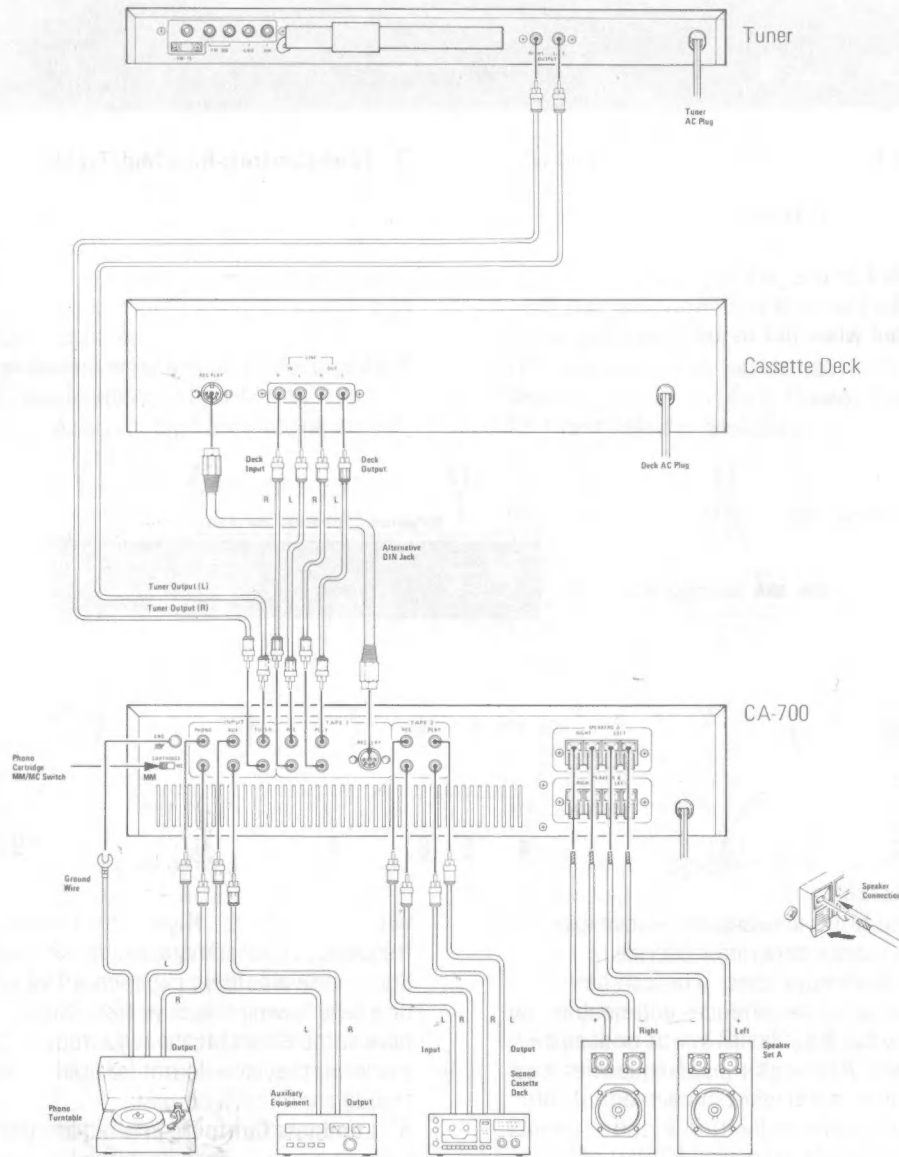
Direct coupled OCL power amplifier with 2 x 70W [IHF] power output/Built-in speaker protection circuit/Wide dynamic range MC/MM phono equalizer with high voltage plus and minus split power supply/Fluorescent power output level indicator with switchable range/Triple tone controls/High and low filters/Tape recording selector permitting recording of any program source while enjoying listening to other program sources/Microphone mixing possible with variable loudness/Illuminated pushbuttons.

Installation

Installation of your amplifier is not complicated. However, the following guidelines must be followed for satisfactory performance and to assure ease of operation.

Do not attempt to remove cover — there are no user serviceable parts inside the unit/Make sure the power switch is off before making any installation and connections/The amplifier and associated equipment must be located on a firm stable base/ The equipment must not be exposed to excessive dust, moisture, or direct sources of heat or sunlight/If mounted where ventilation may be restricted, care must be taken to provide a minimum opening of approximately 50 square inches for free air movement, in and out of the cabinet to the room/ To clean the cabinet, wipe with a cloth soaked in a neutral cleaner or a polishing cloth. Do not use benzine or thinner which will damage the cabinet finish.

Amplifier Connections



Refer to pictorial connection diagram.

**Loudspeakers.** Connect left and right channel speakers to amplifier terminals **Speaker-A**. Use suitable gauge wire. For wire lengths of less than 20 feet (6m), 18 gauge wire is recommended. For longer distances, 16 gauge wire should be used. This is necessary to avoid power loss and to maintain good control or damping of the loudspeakers. Use care not to short circuit speaker cables. Phase properly. That is, connect the positive or plus terminal on each speaker to the corresponding plus terminal on the amplifier. The minus terminals are likewise connected together. This insures that the speakers are working together and not against each other, providing optimum imaging and best bass response. Take care to connect left and right speakers to the proper channel. In the same manner, a second pair of speakers may be connected to the terminals **Speakers-B**.

**Phono Turntables.** Use cables provided with turntable or obtain insulated and shielded one terminated with standard pin (cinch) plug. The turntable should be connected to the **Phono** input jacks. If your turntable is equipped with a MM [moving magnet] phono cartridge, place the **Phono-MM/MC** switch in

Control Functions

- 1 Power Switch.** Depress to turn power on. Illuminated when power is on.
- 2 Headphone Jack.** Accepts plug from a stereo headphone for private listening.
- Since the signal is always fed to this jack regardless of the **Speaker Mode** switches selection, it is recommended that the headphones be disconnected when not in use to avoid possible overload.

the **MM** position, but if equipped with a MC [moving coil] phono cartridge, place the switch in the **MC** position. Connect separate ground lead to amplifier ground terminal [GND].

**Auxiliary Equipment.** Use insulated and shielded audio cables terminated with standard pin (cinch) plug. Connect to **AUX** input jacks on the amplifier. Make proper channel connection. Connect power plug of the auxiliary equipment to wall outlet.

**Tuner.** Use insulated and shielded audio cables terminated with standard pin (cinch) plug, connect to **Tuner** input jacks. Observe proper channel connection. Connect power plug to wall outlet. Provide suitable antenna.

**Tape Decks.** Connect output of main tape deck to **Tape Play 1** jacks, and connect tape deck's input to **Tape Rec 1** jacks. Use insulated and shielded audio cable terminated with cinch pin plug. A second tape deck may be likewise connected to the amplifier except that connections will be made to **Tape Play 2** jacks and **Tape Rec 2** jacks.

**Amplifier Power Supply.** Plug the cord set into the wall outlet supplying 220V 50 Hz AC.

- 3 Tone Controls-Bass/Mid/Treble.** These three tone controls allow you to adjust the tonal balance of the sound output. **Bass.** increases or decreases the level of the low frequencies in the program material. Clockwise rotation increases and counterclockwise rotation decreases. **Mid.** operates in the same manner as the **Bass** control except it provides adjustment of midrange frequency levels. **Treble.** operates in the same manner as other tone controls except it provides adjustment of high frequency levels.

based on the Fletcher-Munson curves. That is, the audio levels of high and low frequencies are boosted.

**6 Stereo/Mono Switch.** Determines the manner in which program material will be reproduced through the left and right channels.

**Stereo (released).** Provides stereophonic reproduction of any stereo program source.

**Mono (depressed).** A program source connected to the left and right channel input jacks is mixed and reproduced through both channels.

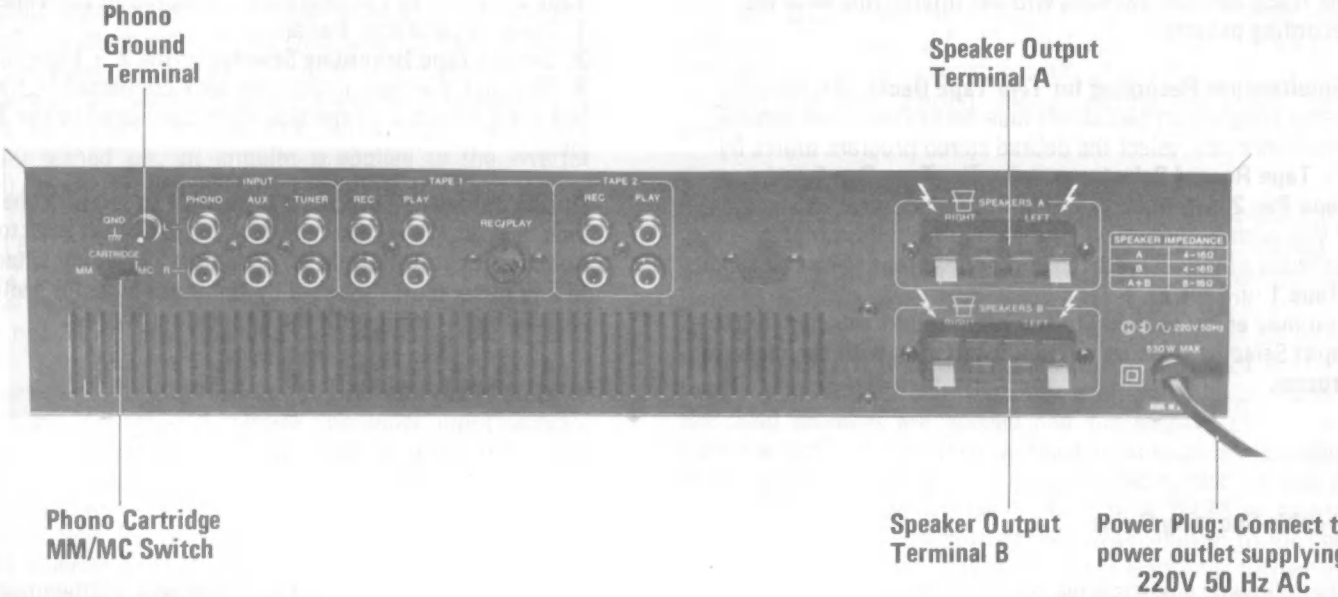
**7 Tape Recording Selector.** This switch selects the program

source to be recorded onto tape decks connected to the **Tape Rec 1** and **Tape Rec 2** output jacks. It provides complete independence from the **Input Selector** switches.

Recording of any source is possible regardless of the reproduction of other program material through the amplifier. **Aux.** Feeds any stereo program source connected to the **AUX** input jacks to tape deck(s).

**Phono.** Phono turntable recording signals are fed to the tape recording output jacks (**Tape Rec 1** and **Tape Rec 2**).

**Tuner.** Provides tuner output signal to the tape deck(s).



- 1 → 2.** Feeds output from the main tape deck to the input of the second tape deck, for tape copying.
- 2 → 1.** Feeds output from the second tape deck to the input of the main tape deck, for tape copying.
- 8 Volume/Balance Controls.** These are concentric controls which permit individual adjustment.
- Volume (outer).** Permits adjustment of the volume for left and right channels simultaneously.
- Balance (inner).** Provides left to right channel balance of the program material. Normally this control should be set to its center [20] position.
- 9 Microphone Volume Control and Jack.** The **Microphone Level** control adjusts the microphone input level for both left and right channels simultaneously. The **Microphone Jack** is the stereo input for 3-conductor stereo microphone. The microphone mixing is possible regardless of the program source being selected on the amplifier.
- 10 Meter Range Switch.** When depressed, reduces the power level indicator range by 1/10 time. May be used for low listening condition.

- 12 Tape Recording Indicators.** Indicate the **Tape Recording Selector** selection — **Aux, Phono, Tuner, 1 → 2, 2 → 1**.
- 13 Input Selector Switches.** Selects the program source to be reproduced through the amplifier. Depressing a switch will automatically releases another switch that is depressed.
- Aux.** Selects the program source connected to the **Aux** input jacks.
- Phono.** Selects the output of stereo turntable connected to the **Phono** input jacks.
- Tuner.** Selects the output of stereo tuner connected to the **Tuner** input jacks.
- Tape 1.** Selects the output of the tape deck connected to the **Tape Play 1** input jacks.
- Tape 2.** Selects the output of the tape deck connected to the **Tape Play 2** input jacks.
- 14 Speaker Switches-A/B.** Permit you to select the speaker listening conditions.

Depressing the **Speakers-A** switch will connect the sound output to the speakers attached to the **Speakers-A** output terminals, and depressing the **Speakers-B** switch will connect the sound output to the speakers attached to the **Speakers-B** output terminals. If you depress both switches at the same time, the sound output will be connected to the speakers attached to the **Speakers-A** and **Speakers-B** output terminals. When both switches are released, all speakers are silenced and the sound output is connected only to the headphones plugged into the **Phones** jack.

**11 Power Level Indicator.** The main amplifier audio power output can be read on the left (upper) and right (lower) channel LED level indicators. These indicators give a direct readout of output power output when amplifier is connected to a pair of 8-Ohm speakers. As the output level increases, the indication advances like; 0.2, 0.8 . . . 50[W]. The LED indicators can react to very short high level pulses which conventional pointer-meters cannot follow.

- 4 Filters-High/Low.** These filters are used to remove low and high frequency noise from various program materials. **Low.** Filters out the very low frequencies. This can be particularly useful when a turntable produces undesirable low frequency signals caused by rumble, record warps or acoustic feedback from loudspeakers. Although these frequencies may not be audible, they can result in excessive movement of the woofer speaker cone, causing intermodulation in the loudspeaker. This filter can be left depressed (On) at all times

with no ill effects. **High.** This filter is used to remove high frequency noise sometimes encountered in program materials. Such noise would be experienced when playing a worn record or a tape having excessive hiss. Since all high frequency filters have some effect on the high frequency response of the program material, they should not be used unless disturbing high frequency noise is present.

**5 Loudness Contour.** When depressed (On), compensates for deficiencies in human hearing ability at low listening levels



Amplifier Operation

**Using a Tape Deck.** To listen to a prerecorded tape, simply play the tape on the main or second tape deck. Select the appropriate **Input Selector** switches [**Tape 1** or **Tape 2**]. To record a stereo program, select the desired program source by the **Tape Recording Selector** switch. This will produce a recording signal at the **Tape Rec 1** and **Tape Rec 2** output jacks. If you wish to monitor the program information that is being recorded, depress the appropriate switch of the Input Selector switches [**Tape 1** or **Tape 2**].  
**You may also enjoy listening to any other source selected by the Input Selector switches without interfering with the recording process.**

**Simultaneous Recording for Two Tape Decks.** To record a stereo program on two stereo tape decks [main and second] simultaneously, select the desired stereo program source by the **Tape Record Selector** switch. The **Tape Rec 1** and **Tape Rec 2** output jacks will both produce a recording signal. If you wish to monitor the program information that is being recorded simply depress the appropriate **Input Selector** switch [**Tape 1** or **Tape 2**].  
**You may enjoy listening to any other source selected by the Input Selector switches without interfering with the recording process.**

Trouble-Shooting-Guide

The following guide is intended as an aid in correcting problems encountered when setting up the stereo system. Although suggested remedy might seem quite elementary, it may be sufficient to make corrections without returning the unit to your dealer.

Problem	Suggested Remedy
Amplifier inoperative when power switched on.	Check blown fuses inside. Refer checking to qualified personnel. Be sure power cord is properly connected to powered outlet having 220V 50 Hz AC.
Indicators lit up but no output any mode of operation.	<b>1</b> Check speaker cables for loose or shorted connection. <b>2</b> Check speaker selector switches for proper speaker selection.
No output one channel.	<b>1</b> Refer to above. <b>2</b> Exchange speaker cables to determine if problem is in speaker or cables. If phono only, check phono cable leads and cartridge connections. <b>3</b> Interchange phono cables to input jacks to check whether the same channel remains inoperative.

**Using the Dubbing System.** In order to duplicate a tape from the tape deck connected to **Tape 1** jacks onto the tape deck connected to **Tape 2** jacks, perform the following:  
**1** Make sure the inputs and outputs of both tape decks are connected to **Tape 1** and **Tape 2** jacks correctly.  
**2** Set the **Tape Recording Selector** to **1 → 2** position.  
**3** Playback the tape on the tape deck connected to the **Tape 1** jacks and record it on the tape deck connected to the **Tape 2** jacks.  
In order to duplicate a tape from tape deck connected to **Tape 2** jacks onto the tape deck connected to the **Tape 1** jacks:  
**1** Perform same step **1** as above.  
**2** Set the **Tape Recording Selector** to the **2 → 1** position.  
**3** Playback the tape on the tape deck connected to the **Tape 2** jacks and record it on the tape deck connected to the **Tape 1** jacks.

**During duplicating process it is possible to monitor the main tape deck or the second tape deck by the Input Selector switches (Tape 1 or Tape 2). You may also enjoy listening to any other source selected by the Input Selector switches without interfering with the duplicating process.**

Scratchy or noisy phono sound.	<b>1</b> Lift tone arm. If the noise stops, the problem probably originates in the cartridge or associated wiring. Repair or replace. <b>2</b> Connect ground lead between turntable mechanism and the amplifier ground terminal, when supplied with the turntable.
Hum, phono only.	<b>1</b> Be sure phono cable plugs are fully inserted in the amplifier input jacks. <b>2</b> Move phono cables around (while listening) to reveal an intermittent or broken shielded lead. Repair or replace. <b>3</b> Connect ground lead as noted above. <b>4</b> Check proper MM/MC switch setting.
Hum, other inputs.	<b>1</b> Check cables and connections. <b>2</b> Reverse amplifier power plug and associated equipment power plug.

Circuit Description

The circuitry of Cybernet model CA-700 consists of 10 major circuits; a MC phono amplifiers, MM phono amplifiers, flat amplifiers, tone amplifiers power amplifiers, mixing microphone amplifier, power transistor and speaker protection circuits, and a power supply circuit. Most of them shown above may be familiar to servicing engineers, so the circuit description will be given to special circuits used in this model.

1. Function Controls

As you know, low level signal handling is the most important and delicate works in assembling a good amplifier and this may determine the major performance of the amplifier. To avoid or to reduce undesirable interference against the low level signals, internal wirings should be as short as possible. To realize this design concept an electronic function selection system has been introduce in stead of a conventional push switch or a rotary switch, thus trouble-some low level wiring leads are eliminated. In operation, when the power switch is initially turned on, an impulse is applied to the inverter U1 (5/6) input through a capacitor of C50. Then second inverter U2 (5/6) through D16 and D8. Then U2 (5/6) output becomes low and the second inverter U2 (6/6) becomes high. Since U2 (6/6) output is connected to the U2 (5/6) input, a positive feedback is established, and the U2 (6/6) output is kept as high level even the impulse applied to the C50 is removed.

Now, transistor Q21 is turned on, and the relay connected to the collector is energized, closing the tuner input selector circuits. Thus the tuner is always selected when the power switch is turned on.

Next, assume the PHONO switch S is depressed, and the positive DC high level signal is applied to the input gate of U1 (3/6) inverter and U1 (4/6) output becomes high in the similar reason just described above, and the Q20 becomes conductive and the phono relay is energized, thus selecting the PHONO inputs. On the other hand, depressing the PHONO switch also makes the transistor Q24 conductive,

so the high level signal kept at U2 (5/6) input circuit is shorted out to the ground through D13 and Q24, thus the tuner selector circuit (Q21 & relay) are turned off. For the remaining selector circuits the same operation theory will be applied.

2. Power Transistor Overload Protection Circuit

This circuit comprised of transistors Q19 and Q21, each base of which is connected to corresponding power transistor emitter. When power transistors Q1 and/or Q3 are subjected to overload condition for any reasons their emitter voltage will be increased due to increased emitter current, the Q19 and Q21 become conductive. Since each collector of the Q19 and Q21 connected to each input circuit of the driver transistors Q15 and Q17, the input circuit will be grounded through the collector-emitter path of Q19 and Q21, thus lowering the load current and protecting the power transistors.

3. Speaker Protection Circuit

This circuit consists of three transistors, Q23, Q24 and Q25, and a relay circuit. Now assume a positive DC voltage is developed at the speaker terminals. Then the voltage appears at the emitter of Q23 through R119 and R121, and this allows a current to flow to the base of Q23 through the diode D14. Then Q23 is turned on and this makes Q24 turn on, resulting in short-circuit the relay exciting coil . . . namely the relay switches are opened and the speaker circuits are disconnected. Next when a negative voltage is developed at the speaker terminals, the voltage is led to the cathode of D13, and this allows current to flow from R122 to emitter of Q13. Then the base current flows from emitter to the base and to the diode D16, resulting in Q23 transistor turned on. Then the Q24 is also turned on, and the relay contacts open in the same way as in the positive voltage developed, thus disconnecting the speaker circuits and protecting the speaker systems.

# Service Information

## Alignment Procedure

### 1. Measurement Conditions

- 1) Reference Temperature: 25°C
- 2) Reference Humidity: 65%

NOTE: Unless otherwise specified, alignment may be performed under the room temperature of 5 – 35°C and humidity of 45 – 80%.

- 3) Power Supply  
Voltage: AC 220V ± 1%  
Frequency: 50 Hz ± 2%  
THD: less than 2%

### 2. Test Equipment

- 1) DC Voltmeter: High input impedance type
- 2) Signal Generator: 20 – 20 kHz

Any test equipment to be used in this alignment should have its known accuracy and capability to operate within a range of specified tolerance.

### 3. Operation and Standard Setting

#### 3.1 Operation of Controls and Switches

- a) **INPUT SELECTOR:** This selects one of five input signals, TUNER, AUX, PHONO, TAPE 1, TAPE 2.

- b) **VOLUME/BALANCE:** These are concentric controls which permit individual adjustment of each function. The inner knob adjusts the left and right channel volume simultaneously, while balance is adjusted by the outer knob.

Rotating clockwise the inner knob, volume level is increased, while decreased by rotating counterclockwise. When the outer knob (balance level controller) is in 12 o'clock position where the center detent is provided, both left and right levels are maximum. Rotating clockwise the balance level controller, left channel is decreased, while counterclockwise, right channel is decreased.

- c) **TONE Controls (BASS, MID and TREBLE):** Each tone controllers with 11 clicks adjusts tonal quality for both left and right channels simultaneously. The BASS control varies audio level by ±10 dB at 100 Hz, the MID control ±6 dB at 1 kHz, and the TREBLE control ±10 dB at 10 kHz.

- d) **METER RANGE:** x 0.1 reduces indicator range by 1/10 (0.02 – 20W).

- e) **HI FIL:** This is provided to reduce high frequency noises and reduce the noises by approx. –3 dB at 7 kHz with HI FIL switch on (attenuation –12 dB/oct).

- f) **LO FIL:** This is provided to reduce low frequency noises especially noises from phono and reduce the low frequency noises by approx. –3 dB at 30 Hz with LO FIL switch on (attenuation –12 dB/oct).

- g) **LOUDNESS:** This compensates for deficiency in human hearing ability at low and high listening level. With the volume control set about –30 dB or more than half, and the LOUDNESS switched on, low and high frequency signal levels are increased by +7 dB at 100 Hz and +3.5 dB at 10 kHz, respectively.

- h) **REC SELECTOR:** Irrespective of the position of the input selector, the program source indicated by this selector comes out at the REC out. For TAPE 1 input, only TAPE 2 comes out at the REC out while for TAPE 2 input, TAPE 1 for REC out. For AUX, PHONO,

and TUNER positions, the input comes out at REC out of both TAPE 1 and TAPE 2.

- i) **SPEAKERS Mode Switches/PHONO Jack:** Depress either A or B and both each position connects the audio output to the speakers attached to the speaker A terminal, or to the speaker B terminal on the rear panel respectively.

Depress both A and B, this connects the audio output simultaneously to the speaker A and speaker B terminals.

The PHONE jack on the front panel is always connected to the output circuits.

- j) **STEREO/MONO Mode Switch:** This switch selects either STEREO or MONO mode of operation.

#### 3.2 Standard Setting of Controls and Switches

- a) **INPUT SELECTOR:** See appropriate adjustment.

- b) **VOLUME/BALANCE:**

**BALANCE:** At 12 o'clock position (center click).

**VOLUME:** Main amplifier adjustment – Maximum,  
Otherwise – Minimum.

- c) **TONE CONTROL:**

**BASS/MID/TREBLE:** At 12 o'clock position.

- d) **METER RANGE:** Release the METER RANGE button (x 1).

- e) **HI FIL:** Release the HI FIL button. (Off)

- f) **LO FIL:** Release the LO FIL button. (Off)

- g) **LOUDNESS:** Release the LOUDNESS button. (Off)

- h) **STEREO/MONO Mode:** Release the STEREO/MONO mode button. (STEREO)

- i) **SPEAKERS Mode:** Select speaker A, unless otherwise specified.

#### 4. Preadjustment

Before turning the power on to start the adjustment, be sure to complete the following.

##### 4.1 Potentiometers Position

Place the potentiometers in positions as stated below, except in a case where the PC board assembly units have been adjusted and inspected.

RV-1, RV-2 (located in PSTA005): Rotate fully counterclockwise,

RV-1, RV-2 (located in PSDS009): At 12 o'clock position.

##### 4.2 Wirings and Conduction Check

Carefully check for correct wirings and parts mounting in the power supply and power amplifier circuits, using a multimeter and visual inspection methods. Especially pay attention to find bridge-soldering on power transistor circuits, plus and minus B lines. Also pay attention to wirings of the regulated voltage circuit and polarity of block type electrolytic capacitors.

#### 5. Alignment

The alignment should be performed in sequence as stated below.

##### 5.1 Main Amplifier Adjustment

The main amplifier adjustment should be conducted first. No power voltage should be supplied for a long period of time to the amplifier before being adjusted.

- 1) Connect DC voltmeter between **TP-1** and **TP-2** (located on PSZQ013). Adjust **RV-1** for **12 mV ± 2 mV**.

- 2) Connect DC voltmeter between **TP-3** and **TP-4** (located on PSZQ014). Adjust **RV-2** for **12 mV ± 2 mV**.

##### 5.2 Meter Adjustment

- 1) Rotate Volume fully counterclockwise.

- 2) Apply signal generator 43.5 dB (150 mV) to AUX input.

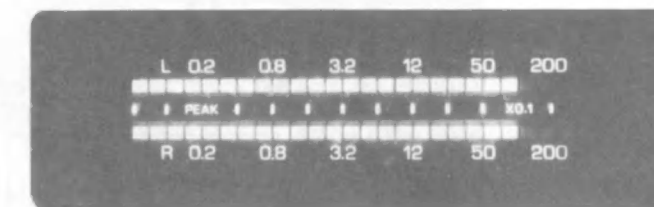
- 3) Connect voltmeter (and 8 Ohm dummy load) across speaker output terminals.

- 4) Rotate Volume clockwise until voltmeter will read 6.93V.

- 5) Rotate **RV-1** (left channel, located on PSDS009) so that fluorescent dots light up as shown.



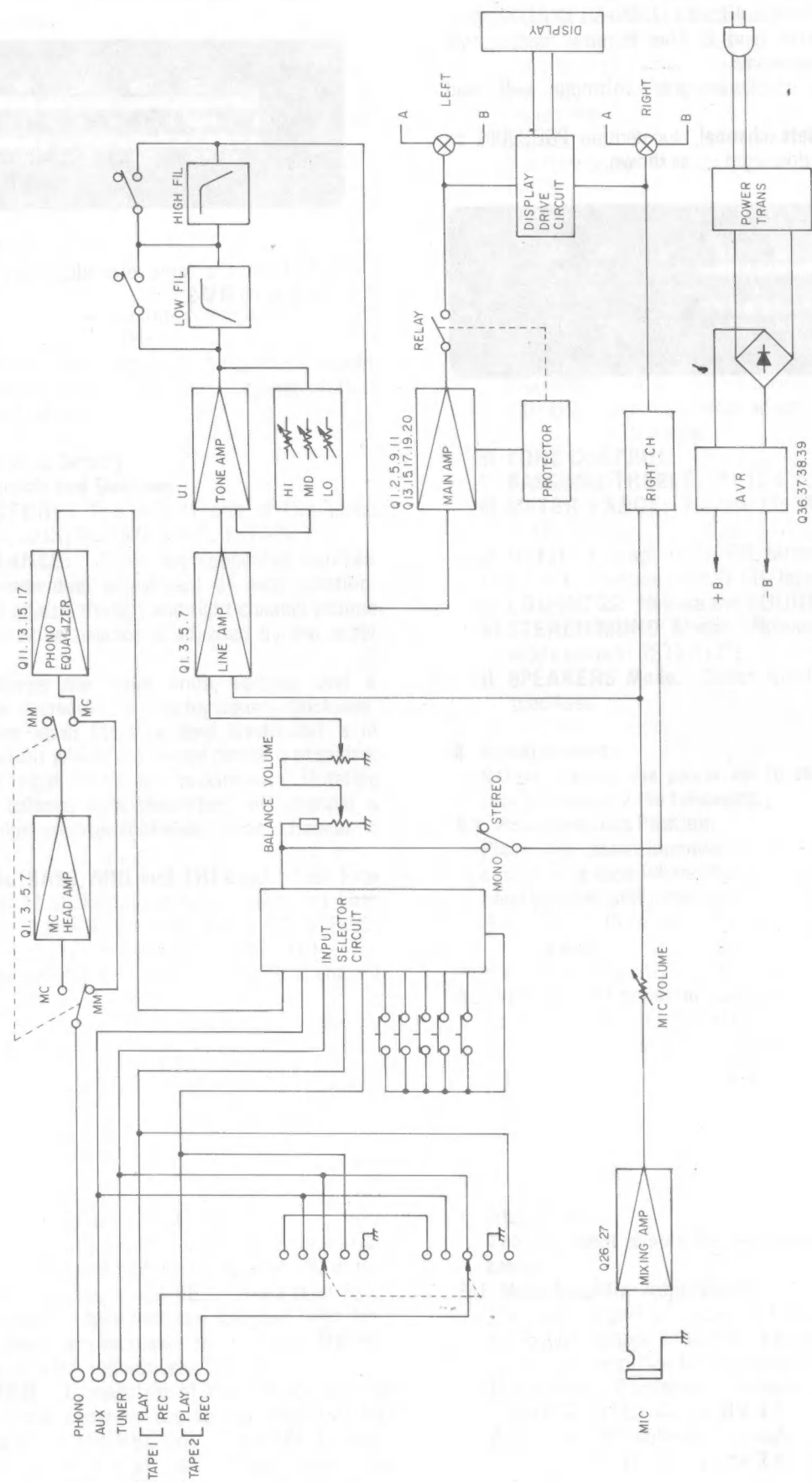
- 6) Depress METER RANGE button (x0.1 lights up), check that fluorescent dots light up as shown.



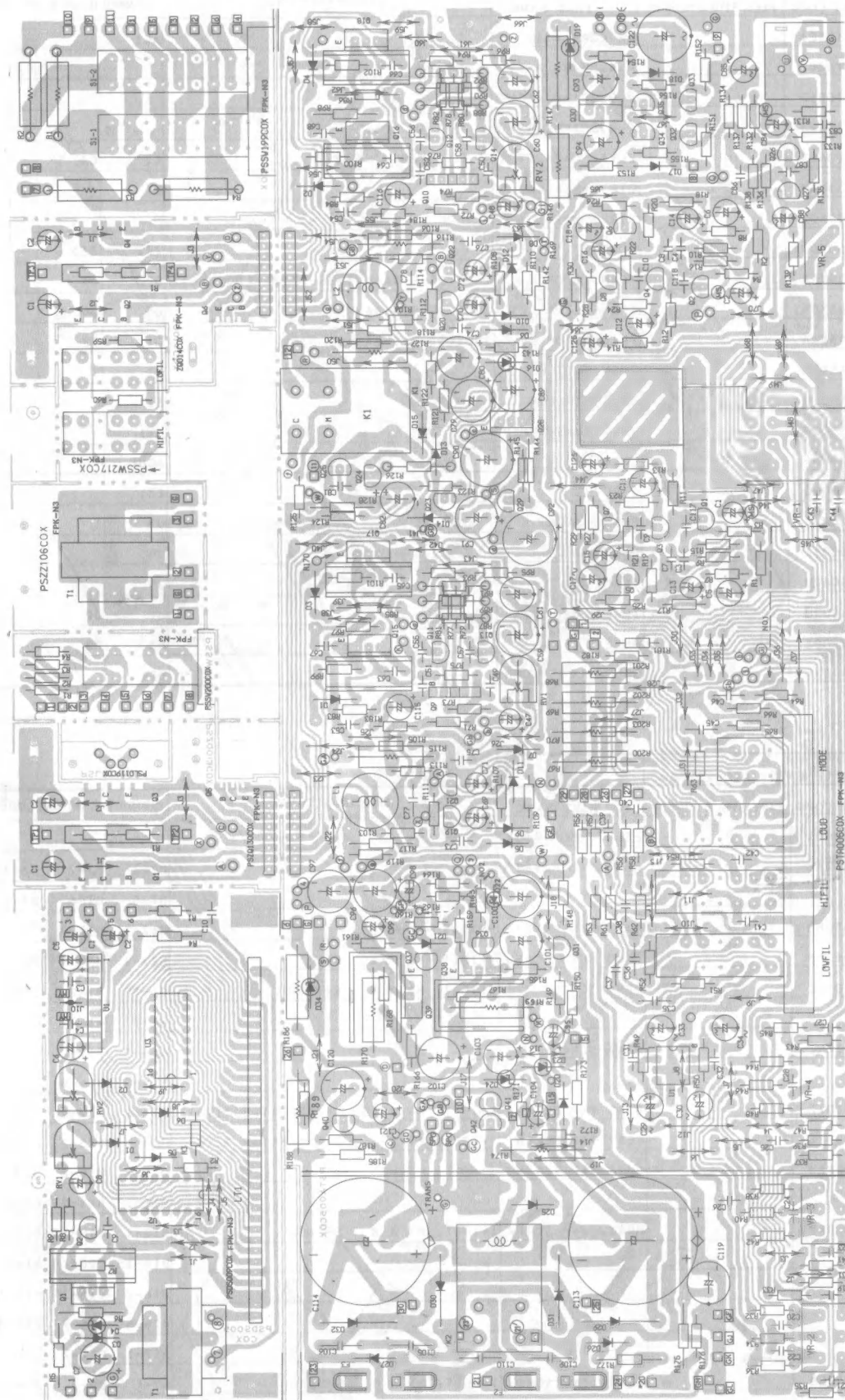
- 7) Perform the same procedures on **right channel** except adjusting **RV-2**.

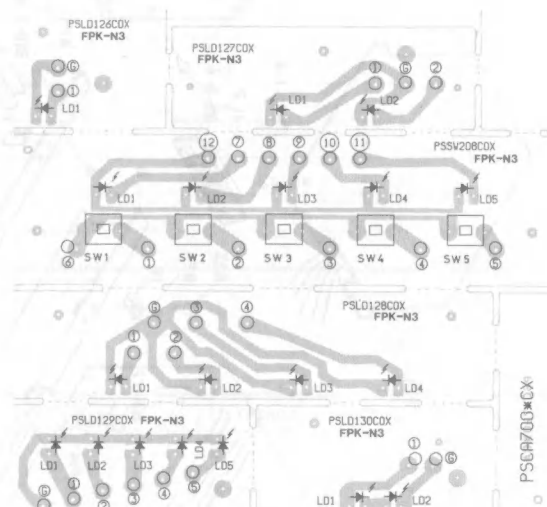
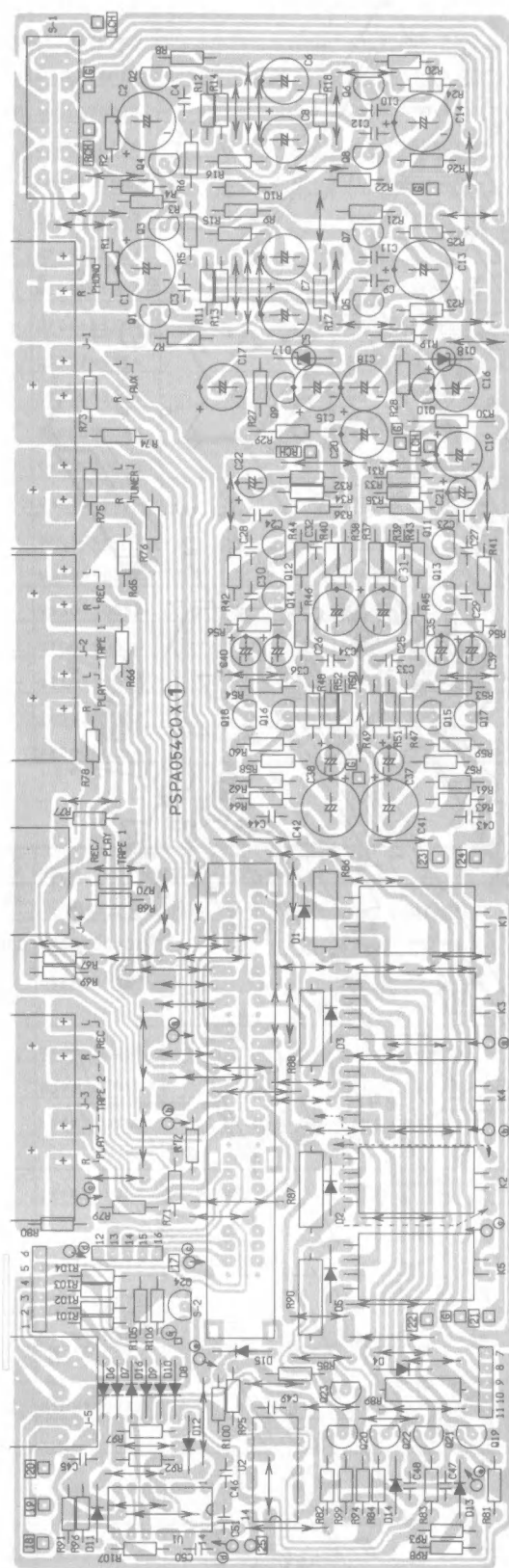


Block Diagram



PC Board Layout



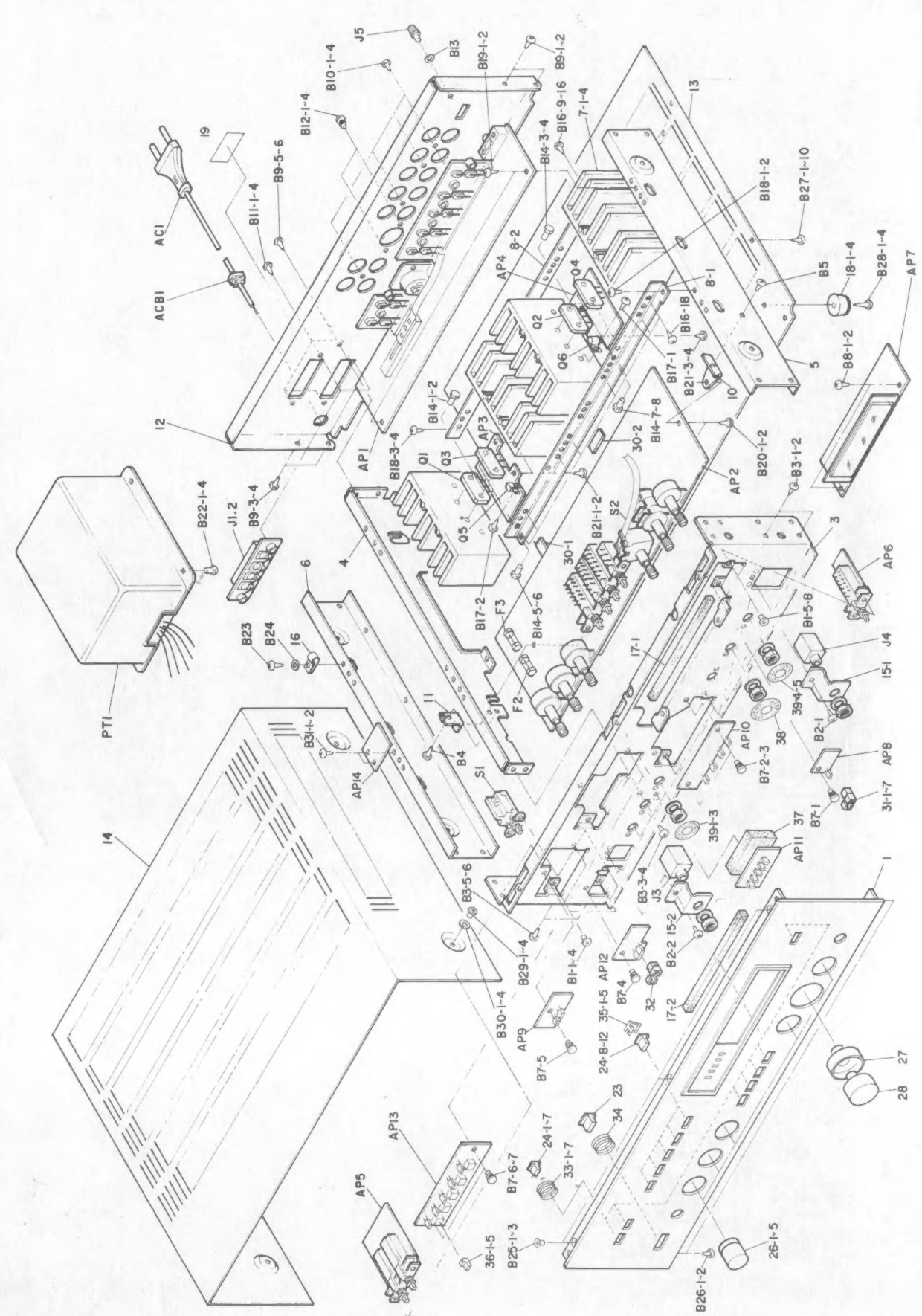


EXPLODED ASSEMBLY		PART NAME	PART CODE							
MECH. ELEMENTS		AAC29ASMCL2								
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1						B21-3	B21-4			
2		BTPW3008BZ		BRAS. TAP SCREW	(+)BIT, M3 X 8 S-ZNCR	B18-1	B18-2	B18-3	B18-4	3
3						B19-1	B19-2	B2-1	B2-2	
4						B23	B26-1	B26-2	B27-1	
5						B27-10	B27-2	B27-3	B27-4	
6						B27-5	B27-6	B27-7	B27-8	
7						B27-9	B3-1	B3-2	B3-3	
8						B3-4	B3-5	B3-6	B31-1	
9						B31-2	B4	B5	B8-1	
10						B8-2				
11		BTPW3010BZ		BRAS. TAP SCREW	(+)BIT, M3 X 10 S-ZNCR	B28-1	B28-2	B28-3	B28-4	4
12		BWM30A08SN		FLAT L. WASHER	FLAT LARGE, 3 M/M S-NI	B13	B24			2
13		BWM50C08SN		FLAT L. WASHER	FLAT LARGE, 5 M/M S-NI	B30-1	B30-2	B30-3	B30-4	4
14		MB851SX003		SIDE BRACKET L		4				1
15		MB962SK009		REAR PANEL		12				1
16		MB962SX005		FRONT PANEL		3				1
17		MH746AD001		HEAT SINK		7-1	7-2	7-3	7-4	4
18		ML122SX002		BP BRACKET		11				1
19		ML221LD003		SPRING F		35-1	35-2	35-3	35-4	5
20						35-5				
21		ML332SZ011		BRACKET PWB F		10				

EXPLODED ASSEMBLY		PART NAME		PART CODE						
MECH. ELEMENTS		AAC29ASMCL2								
REV	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		ML821SX002		HEAT BRACKET		8-1	8-2			2
2		MN276XA038		KNOB		26-1	26-2	26-3	26-4	5
3						26-5				
4		MN286XA064		KNOB W R		27				1
5		MN286XA065		KNOB W L		28				1
6		MS986SL011		BOTTOM PLATE		13				1
7		MU851SX001		SIDE BRACKET R		5				1
8		MU851SX002		SIDE BRACKET		6				1
9		MU896SM006		COVER		14				1
10		MW271LY004		SPRING A		33-1	33-2	33-3	33-4	7
11						33-5	33-6	33-7		
12		MW271LY005		SPRING C		34				1
13		MZ232SX001		JACK BRACKET		15-1	15-2			2
14		VK111SB002		ADAPTER SW		36-1	36-2	36-3	36-4	5
15						36-5				
16		VM283SB001		FOOT		18-1	18-2	18-3	18-4	4
17		VN220AX001		BUTTON A		24-1	24-10	24-11	24-12	12
18						24-2	24-3	24-4	24-5	
19						24-6	24-7	24-8	24-9	
20		VN220AX003		BUTTON C		23				1
21		VQ422MB001		SPONGE		37				



Exploded View



Replacement Parts List

EXPLODED ASSEMBLY		PART NAME		PART CODE				
ELEC. ELEMENTS		AAC29ASMCL1						
EXPLODED ASSEMBLY	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		ACAC035EEA		AC CORD ASSY		AC1		1
2	EXPLODED	APSCA700*1		P.W.B. BOARD ASSY				1
3	EXPLODED	APSLA70012		P.W.B. BOARD ASSY				1
4	EXPLODED	APSLA70023		P.W.B. BOARD ASSY				1
5		CEAG010ALX		ELYT. CAPACITOR	1MFD 50V	C2	C3	2
6		CNST103MAN		OIL PAPER CAP.		C1		1
7		GCA700*A02		WIRES KIT				1
8		MPI215D003		HOLDER		Z22	Z23	2
9		QTB0705XAA		TRANSISTOR	ZSB705S,R-RANKWITHS-27(MP-100SHEET)	Q3	Q4	2
10		QTC1685XDN		TRANSISTOR	ZSC1685 R,S-RANK	Q5	Q6	2
11		QTD0745XAA		TRANSISTOR	ZSD745 R,S-RANK	Q1	Q2	2
12		SP01AAS13N		PUSH SWITCH		S1		1
13		SR0005006N		SW CONTROLER		S1		1
14		TPH96S002N		PWR. TRANSFORMER		PT1		1
15		VM270NB004		BUSHING		ACB1		1
16		VX432VL002		C-COVER		ZZ1		1
17		YJS03S023Z		PHONE JACK		J3		1
18		YJS07S005Z		PHONE JACK		J4		1
19		YTD01S002U		TERMINAL		J5		1
20		YTS04S007U		TERMINAL		J1	J2	2
21		ZFBQ80203Z		FUSE		F2	F3	2
22		ZZZ0000154		SOLDERLESS CONN		ZZ4		1

EXPLODED ASSEMBLY		PART NAME		PART CODE						
MECH. ELEMENTS		AAC29ASMCL2								
ITEM	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1	EXPLODED	AMCA700*01		ESCUTCHEON ASSY		1				1
2		BRP3045QNB		PAN HEAD RIVET		B7-1	B7-2	B7-3	B7-4	7
3						B7-5	B7-6	B7-7		
4		BRP3055QNB		PAN HEAD RIVET	3MX5.5	B12-1	B12-2			2
5		BSPB5010NN		BIND HEAD SCREW	(+)BIT, M5 X 10 S-NI	B29-1	B29-2	B29-3	B29-4	4
6		BSPC3005NZ		GEMS SCREW	(+)BIT, M3 X 5 S-ZNCR	B1-1	B1-2	B1-3	B1-4	8
7						B1-5	B1-6	B1-7	B1-8	
8		BSPR3010NZ		HEXA SCREW		B14-1	B14-2	B14-3	B14-4	8
9						B14-5	B14-6	B14-7	B14-8	
10		BTPB4010TZ		BIND TAP SCREW	(+)BIT, M4 X 10 S-ZNCR (TAP TITE)	B22-1	B22-2	B22-3	B22-4	4
11		BTPS3008TZ		FLAT TAP SCREW	(+)BIT, M3 X 8 S-ZNCR (TAP TITE)	B25-1	B25-2	B25-3		3
12		BTPW3008AB		BRAS TAP SCREW		B10-1	B10-2	B10-3	B10-4	8
13						B11-1	B11-2	B11-3	B11-4	
14		BTPW3008AZ		BRAS. TAP SCREW	(+)BIT, M3 X 8 S-ZNCR	B16-1	B16-10	B16-11	B16-12	18
15						B16-13	B16-14	B16-15	B16-16	
16						B16-2	B16-3	B16-4	B16-5	
17						B16-6	B16-7	B16-8	B16-9	
18						B17-1	B17-2			
19		BTPW3008BB		BRAS. TAP SCREW	(+)BIT, M3 X 8 S-BLACK	B9-1	B9-2	B9-3	B9-4	6
20						B9-5	B9-6			
21		BTPW3008BJ		BRAS. TAP SCREW		B20-1	B20-2	B21-1	B21-2	6



EXPLODED ASSEMBLY		PART NAME		PART CODE						
		MECH. ELEMENTS		AAC29ASMCL2						
ITEM NO.	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		VQ611RB002		FLE. SHEET		17-1	17-2			2
2		VS117FB001		SW BUSH		40				1
3		VS416RB001		BOTTOM SHEET		30-1	30-2			2
4		VS417NN003		CLAMPER.		16				1
5		VS805YB004		SHEET A		38				1
6		VS805YB005		SHEET B		39-1	39-2	39-3	39-4	5
7						39-5				
8		VVSCA700E1		SER.NO.PLATE		19				1
9		VX222SW001		ADAPTER BUTT A		31-1	31-2	31-3	31-4	7
10						31-5	31-6	31-7		
11		VX222SW002		ADAPTER BUTT C		32				1
12										
13										
14		KPCA700E01		INNER CARTON	[PACKING MATTER]					1
15										
16		ACSP001GEA		ST. AUDIO CABLE	[ACCESSORIES]					1
17										
18										
19										
20										
21										

EXPLODED ASSEMBLY		PART NAME		PART CODE				
		ESCUTCHEON ASSY		AMCA70001				
ITEM NO.	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		ME96EAA030		ESCUTCHEON		1-A		1
2		VF174SX003		FRAME		1-B		1
3		VK172SB001		BUTTON GUIDE F		1-E		1
4		VK222SB003		BUTTON GUIDE C		1-D		1
5		VK272SB002		BUTTON GUIDE A		1-F		1
6		VS747AS002		PLATE		1-C		1
7								
8								
9								

EXPLODED ASSEMBLY		PART NAME		PART CODE				
		P.W. BOARD ASSY		APSCA7001				
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1	EXPLODED	APSLD126AA		P.W. BOARD ASSY				1
2	EXPLODED	APSLD127AA		P.W. BOARD ASSY				1
3	EXPLODED	APSLD128AA		P.W. BOARD ASSY				1
4	EXPLODED	APSLD129AA		P.W. BOARD ASSY				1
5	EXPLODED	APSLD130AA		P.W. BOARD ASSY				1
6	EXPLODED	APSSW208AA		P.W. BOARD ASSY				1
7								
8								
9								

EXPLODED ASSEMBLY		PART NAME		PART CODE				
		P.W. BOARD ASSY		APSDS009AD				
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		BTPW3008AZ		BRAS. TAP SCREW	(+)BIT, M3 X 8 S-ZNCR	B1		1
2		CEVE101ALX		ELYT. CAPACITOR		C7		1
3		CEVE470ALX		ELYT. CAPACITOR		C6		1
4		CEVG010ALX		ELYT. CAPACITOR		C1	C2 C5	3
5		CKFB473ZFY		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C10	C9	2
6		CQMB682KTH		MYLAR CAPACITOR	6800PF 50V -10, +10%	C3	C4	2
7		MU242AD004		HEAT SINK		HS1		1
8		MW201BS001		TERMINAL				8
9		MW401CX002		SHORT JUMPER				1
10		MW401CX004		SHORT JUMPER	JW-5			1
11		MW401CX006		SHOT JAMPER	10MM			8
12		PSDS009COX		PRINTED W. BOARD				1
13		QDSMA150XN		SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1	D2 D5 D6	4
14		QDZ180EB3A		ZENER DIODE	RD18EB3 VZ=17.42-18.33V	D4		1
15		QQM07318AT		I.C.	TA7318P-2	U1		1
16		QQM1201OAB		IC	HA12010	U2	U3	2
17		QTC1826XBD		TRANSISTOR	2SC1826 O, Y-RANK NO ACCESSORIES	Q1		1
18		RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R1	R3	2
19		RD25TJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R2		1
20		RGHARJ181B		M-OXIDE FILM R.		R4		1
21		RGHARJ222B		M-OXIDE FILM R.		R6		1

EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W. BOARD ASSY		APSDS009AD					
3	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1		RG1ARJ221B		M-OXIDE FILM R.		R5			1
2		RPJNB22201		SEMI FIXED VR.		RV1	RV2		2
3		ZL24EW17XA		DISPLAY TUBE	FIP24EW17YS	LT1			1

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P=W=BOARD ASSY		APSLA70012						
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS			SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1	EXPLODED	APSPA054BD		P=W=BOARD ASSY						1
2										

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W. BOARD ASSY		APSLA70023						
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1	EXPLODED	APSDS009AD		P.W. BOARD ASSY						1
2	EXPLODED	APSSW199BA		P.W. BOARD ASSY						1
3	EXPLODED	APSSW200AA		P.W. BOARD ASSY						1
4	EXPLODED	APSSW217AA		P.W. BOARD ASSY						1
5	EXPLODED	APSTA005CD		P.W. BOARD ASSY						1
6	EXPLODED	APSZQ013AD		P.W. BOARD ASSY						1
7	EXPLODED	APSZQ014AD		P.W. BOARD ASSY						1
8	EXPLODED	APSZZ106AA		P.W. BOARD ASSY						1
9										
10										

EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.B. BOARD ASSY	APSLD126AA						
REV	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		PSLD126C0X		P.W.B. BOARD					1
2		QLBLN317GN		L.E.D.	LN317GP	GREEN	LD1		1
3		WUG051EKXX		HI-WRAP WIRE			NO2		1
4		WUG715EKXX		HI-WRAP WIRE			NO1		1

EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.B. BOARD ASSY		APSLD127AA					
REV.	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		PSLD127C0X		P.W.B. BOARD					1
2		QLBLN317GN		L.E.D.	LN317GP	GREEN	LD1	LD2	2
3		WUGD16EKXX		HI-WRAP WIRE			NO1		1
4		WUGY16EKXX		HI-WRAP WIRE			NO2		1
5		WUGO19EKXX		HI-WRAP WIRE			NO3		1

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W.B. BOARD ASSY		APSLD128AA						
REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1	PSLD128C0X		P.W.B. BOARD							1
2	QLBLN317GN		L.E.D.	LN317GP	GREEN	LD1	LD2	LD3	LD4	4
3	WUG017EKXX		HI-WRAP WIRE			NO5				1
4	WUG117EKXX		HI-WRAP WIRE			NO1				1
5	WUG217EKXX		HI-WRAP WIRE			NO2				1
6	WUG317EKXX		HI-WRAP WIRE			NO3				1
7	WUG417EKXX		HI-WRAP WIRE			NO4				1

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W.B. BOARD ASSY	APSLD129AA							
QTY USED	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		ACCN459GEA		CONN CORD ASSY.		AC1				1
2		PSLD129C0X		P.W.B. BOARD						1
3		QLBLN324GN		L.E.D	LN324GP GREEN	LD1	LD2	LD3	LD4	5
4						LD5				
5		WUG040EKXX		HI-WRAP WIRE		NO1				1
6										
7										
8										
9										

EXPLODED ASSEMBLY		PART NAME		PART CODE	STOCK NO.			
		P.W.B. BOARD ASSY		APSLD130AA				
ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		PSLD130C0X		P.W.B. BOARD				1
2		QLBLN417YN		L.E.D. DIODE	LN417YP GRANGE	LD1	LD2	2
3		WUG018EKXX		HI-WRAP WIRE		NO2		1
4		WUG318EKXX		HI-WRAP WIRE		NO1		1
5								
6								
7								
8								
9								

EXPLODED ASSEMBLY		PART NAME		PART CODE								
		P.W.B. BOARD ASSY		APSPA054BD								
LINE	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS			SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		CCFB151KOT		CERAMIC CAP.	150PF	50V	-10, +10% SL	C23	C24			2
2		CCFB221KOT		CERAMIC CAP.	220PF	50V	-10, +10% SL	C10	C11	C12	C9	4
3		CCGB101KOT		CERAMIC CAP.	100PF	50V	-10, +10% SL	C29	C30			2
4		CCGB390KOT		CERAMIC CAP.	39PF	50V	-10, +10% SL	C27	C28			2
5		CEAC221ALX		ELYT. CAPACITOR	220MFD	10V		C15	C16	C17	C18	10
6								C25	C26	C5	C6	
7								C7	C8			
8		CEAC470ALX		ELYT. CAPACITOR	47MFD	10V		C35	C36			2
9		CEAD100ALX		ELYT. CAPACITOR	10MFD	16V		C39	C40	C51	C52	7
10								C53	C54	C55		
11		CEAD101NAN		ELYT. CAPACITOR				C13	C14			2
12		CEAD470NAN		ELYT. CAPACITOR				C1	C2			2
13		CEAE101ALX		ELYT. CAPACITOR	100MFD	25V		C19	C20			2
14		CEAE4R7ALX		ELYT. CAPACITOR	4.7MFD	25V		C37	C38			2
15		CEAE4R7NAN		ELYT. CAPACITOR				C41	C42			2
16		CEAE4R7ZMN		ELYT. CAPACITOR	4.7MFD	25V	MS	C21	C22			2
17		CKFB103ZFT		CERAMIC CAP.	0.01MFD	50V	-20, +80% F	C45	C46	C47	C48	5
18								C49				
19		CKFB473ZFT		CERAMIC CAP.	0.047MFD	50V	-20, +80% F	C50				1
20		CQMB103KTH		MYLAR CAPACITOR	0.01MFD	50V	-10, +10%	C3	C4			2
21		CQMB152KTH		MYLAR CAPACITOR				C43	C44			2

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W.B. BOARD ASSY	APSPA054BD							
ITEM	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		CQVB183JCN		MYLAR FILM CAP		C33	C34			2
2		CQVB683JCN		MYLAR FILM CAP.		C31	C32			2
3		MW201BS001		TERMINAL						6
4		MW401CX001		SHORT JUMPER	JW-10					11
5		MW401CX005		SHORT JAMPER	JW-15					20
6		MW401CX006		SHOT JAMPER	10MM					52
7		PSLA7001CX		PRINTED W.B. BOARD						1
8		PSPA054C0X		PRINTED W.B. BOARD						1
9		QDSMA150XN		SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1	D10	D11	D12	16
10						D13	D14	D15	D16	
11						D2	D3	D4	D5	
12						D6	D7	D8	D9	
13		QDZ8R2EB2A		ZENER DIODE	RD8.2EB2 VZ=7.78-8.19V	D17	D18			2
14		QQ004069AA		I.C.	UPD4069C HEX INVERTER	U1	U2			2
15		QTA0564AEN		TRANSISTOR	2SA564A R,S-RANK 50V	Q10	Q17	Q18		3
16		QTA0722XAN		TRANSISTOR	2SA722	Q5	Q6			2
17		QTA0991XAA		TRANSISTOR	2SA991 E,F-RANK	Q11	Q12			2
18		QTA1092XAN		TRANSISTOR	2SA1092 S,T-RANK	Q3	Q4			2
19		QTC1328XBN		TRANSISTOR	2SC1328 R,S-RANK	Q13	Q14	Q7	Q8	4
20		QTC1685XDN		TRANSISTOR	2SC1685 R,S-RANK	Q15	Q16	Q19	Q20	9
21						Q21	Q22	Q23	Q24	

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD ASSY	APSPA054BD									
1										Q9	
2						QTC2557XAN		TRANSISTOR	25C2557 S,T-RANK	Q1 Q2	2
3						RD25PJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R106 R41 R42 R49	5
4										R50	
5						RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R101 R102 R103 R104	11
6										R105 R31 R32 R33	
7										R34 R69 R70	
8						RD25PJ105X		CARBON FILM R.	0.25W 1M OHM 5%	R73 R74 R75 R76	6
9										R77 R78 R79 R80	
10						RD25PJ123X		CARBON FILM R.	0.25W 12K OHM 5%	R51 R52 R81 R82	7
11										R93 R84 R85	
12						RD25PJ152X		CARBON FILM R.	0.25W 1.5K OHM 5%	R25 R26	2
13						RD25PJ155X		CARBON FILM R.	0.25W 1.5M OHM 5%	R107	1
14						RD25PJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R55 R56 R65 R66	6
15										R71 R72	
16						RD25PJ224X		CARBON FILM R.	0.25W 220K OHM 5%	R61 R62	2
17						RD25PJ271X		CARBON FILM R.	0.25W 270 OHM 5%	R23 R24	2
18						RD25PJ272X		CARBON FILM R.	0.25W 2.7K OHM 5%	R53 R54	2
19						RD25PJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R4	1
20						RD25PJ362X		CARBON FILM R.	0.25W 3.6K OHM 5%	R11 R12 R13 R14	4
21										R15 R16 R17 R18	

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD ASSY	APSPA054BD									
1						SH060609UN		SLIDE ROTARY SW		S2	
2						SS040204ZA		SLIDE SWITCH		S1	
3						WUGV41EKXX		HI-WRAP WIRE		NO28	
4						WUG047EKXX		HI-WRAP WIRE		NO11	
5						WUG112EEXX		HI-WRAP WIRE		NO3	
6						WUG212EEXX		HI-WRAP WIRE		NO4	
7						WUG313EEXX		HI-WRAP WIRE		NO5	
8						WUG411EEXX		HI-WRAP WIRE		NO6	
9						WUG511EEXX		HI-WRAP WIRE		NO7	
10						WUG535EKXX		HI-WRAP WIRE		NO10	
11						WUG609EEXX		HI-WRAP WIRE		NO8	
12						WUG709EEXX		HI-WRAP WIRE		NO9	
13						WWF517JJJJ		SHIELDED WIRE		NO1	
14						YJD05S011Z		5P DIN JACK		J4	
15						YJF05S004Z		JUNCTION JACK	B5P-SHF-1AA	J7 J8	2
16						YJF06S003Z		JUNCTION JACK	B6P-SHF-1AA	J6	1
17						YJP04S020U		4P PIN JACK		J2 J3	2
18						YJP06S010U		6P PIN JACK		J1	1
19						ZRZ232001Z		REED RELAY		K1 K2 K3 K4	5
20										K5	
21											

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD ASSY	APSPA054BD									
1						RD25PJ392X		CARBON FILM R.	0.25W 3.9K OHM 5%	R45 R46	2
2						RD25PJ394X		CARBON FILM R.	0.25W 390K OHM 5%	R67 R68 R91 R92	7
3										R93 R94 R95	
4						RD25PJ470X		CARBON FILM R.	0.25W 47 OHM 5%	R1 R2 R35 R36	6
5										R47 R48	
6						RD25PJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R43 R44	2
7						RD25PJ561X		CARBON FILM R.	0.25W 560 OHM 5%	R63 R64	2
8						RD25PJ680X		CARBON FILM R.	0.25W 68 OHM 5%	R19 R20 R21 R22	6
9										R57 R58 R59 R60	
10						RD25PJ681X		CARBON FILM R.	0.25W 680 OHM 5%	R10 R27 R28 R7	4
11										R8 R9	
12						RD25PJ693X		CARBON FILM R.	0.25W 68K OHM 5%	R100 R96 R97 R98	5
13										R99	
14						RD25PJ8R2X		CARBON FILM R.	0.25W 8.2 OHM 5%	R5 R6	2
15						RD25PJ820X		CARBON FILM R.	0.25W 82 OHM 5%	R39 R40	2
16						RD25PJ823X		CARBON FILM R.	0.25W 82K OHM 5%	R37 R38	2
17						RD25PJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R3	1
18						RGHARJ122B		M-OXIDE FILM R.		R86 R87 R98 R89	5
19										R90	
20						RGHARJ221B		M-OXIDE FILM R.		R29 R30	2
21						SH060609UN		SLIDE SWITCH			1

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD ASSY	APSSW199BA									
1						MW201BS001		TERMINAL			11
2						PSSW199C0X		PRINTED W.B.O.A.R.D			1
3						RG2ARJ271B		M-OXIDE FILM R.		R3 R4	2
4						RG2ARJ272B		M-OXIDE FILM R.		R1 R2	2
5						SP02CAX09A		PUSH SWITCH		S1	1
6											
7											
8											
9											

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD ASSY	APSSW200AA									
1						MW201BS001		TERMINAL			6
2						PSSW200C0X		PRINTED W.B.O.A.R.D			1
3						RD25PJ123X		CARBON FILM R.	0.25W 12K OHM 5%	R1 R2	2
4						RD25PJ303X		CARBON FILM R.	0.25W 30K OHM 5%	R3 R4	2
5						SP01AAX51A		PUSH SWITCH		S1	1
6											
7											
8											
9											



EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W.B.O.A.R.D ASSY		APSSW208AA						
QTY	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		ACCN459GEA		CONN CORD ASSY.		AC2				
2		ACCN460GEA		CONN CORD ASSY.		AC1				
3		PSCA700CX		PRINTED W.B.O.A.R.D						
4		PSSW208COX		P.W.B.O.A.R.D						
5		QLBLN317GN		L.E.D.	LN317GP GREEN	LD1	LD2	LD3	LD4	
6						LD5				
7		SP01ABX44A		PUSH SWITCH		S1	S2	S3	S4	
8						S5				
9		WUG631EKXX		HI-WRAP WIRE		NO1				
10										

EXPLODED ASSEMBLY		PART NAME		PART CODE				
		P.W.B.O.A.R.D A.S.S.Y		APSSW217AA				
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		PSSW217C0X		PRINTED W.B.O.A.R.D				1
2		RD25PJ622X		CARBON FILM R.	0.25W 6.2K OHM 5%	R59	R60	2
3								
4								
5								
6								
7								
8								

EXPLODED ASSEMBLY		PART NAME		PART CODE												
		P.W.B.O.A.R.D ASSY		APSTA005C0												
EXPLODED ASSEMBLY	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS						SYMBOLIC OR EXPLODED VIEW NO.				QTY USED	
1		BTPW3008AZ		BRAS. TAP SCREW	(+)	BIT, M3 X 8	S-ZNCR					B1	B2	B3	B4	6
2												B5	B6			
3		CCFB151KOT		CERAMIC CAP.		150PF	50V	-10, +10% SL				C51	C52			2
4		CCFB331KOT		CERAMIC CAP.		330PF	50V	-10, +10% SL				C43	C44			2
5		CCGB020COT		CERAMIC CAP.	SL	2PF	50V	-0.25, +0.25PF				C53	C54			2
6		CCGB100DOT		CERAMIC CAP.	SL	10PF	50V	-0.5, +0.5PF				C57	C58			2
7		CCGB101KOT		CERAMIC CAP.		100PF	50V	-10, +10% SL				C83	C86			2
8		CCGB150KOT		CERAMIC CAP.		15PF	50V	-10, +10% SL				C117	C118	C55	C56	4
9		CCGB220KOT		CERAMIC CAP.		22PF	50V	-10, +10% SL				C10	C9			2
10		CCGB470KOT		CERAMIC CAP.		47PF	50V	-10, +10% SL				C3	C31	C32	C4	4
11		CCGB680KOT		CERAMIC CAP.		68PF	50V	-10, +10% SL				C49	C50	C63	C64	7
12												C65	C66	C87		
13		CCGB820KOT		CERAMIC CAP.		82PF	50V	-10, +10% SL				C7	C8			2
14		CEAC470ALX		ELYT. CAPACITOR		47MFD	10V					C115	C116			2
15		CEAE100NAN		ELYT. CAPACITOR								C17	C18	C33	C34	4
16		CEAE4R7ALX		ELYT. CAPACITOR		4.7MFD	25V					C69	C70	C71	C72	4
17		CEAE4R7NAN		ELYT. CAPACITOR								C29	C30	C88		3
18		CEAF101ALX		ELYT. CAPACITOR		100MFD	35V					C101	C102	C89		3
19		CEAF221ALX		ELYT. CAPACITOR		220MFD	35V					C90				1
20		CEAG2R2ZMN		ELYT. CAPACITOR		2.2MFD	50V	MS				C1	C2	C84		3
21		CEAH010ALX		ELYT. CAPACITOR		1MFD	63V					C121				1

EXPLODED ASSEMBLY		PART NAME		PART CODE								
		P.W.B.O.A.R.D ASSY		APSTA005CD								
QTY USED	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS			SYMBOLIC OR EXPLODED VIEW NO.			QTY USED	
3		CEAH101ALX		ELYT. CAPACITOR	100MFD	63V		C120	C91	C92	3	
2		CEQ1H10301		ELYT. CAPACITOR				C113	C114		2	
3		CEVC101ALX		ELYT. CAPACITOR				C103	C79	C80	3	
1		CEVC221ALX		ELYT. CAPACITOR				C100			1	
5		CEVC470ALX		ELYT. CAPACITOR				C11	C12	C5	C6	5
								C85				
4		CEVD100ALX		ELYT. CAPACITOR				C15	C16	C61	C62	4
2		CEVE101ALX		ELYT. CAPACITOR				C96	C97			2
4		CEVE4R7ALX		ELYT. CAPACITOR				C125	C126	C13	C14	4
2		CEVF470ALX		ELYT. CAPACITOR				C59	C60			2
1		CEVG010ALX		ELYT. CAPACITOR				C95				1
4		CEVG2R2ALX		ELYT. CAPACITOR				C47	C48	C98	C99	4
1		CEVH220ALX		ELYT. CAPACITOR				C82				1
2		CKDE103PEM		CERAMIC CAP.	0.01MFD	500V	-0, +100% E	C105	C106			2
4		CQMB103KTH		MYLAR CAPACITOR	0.01MFD	50V	-10, +10%	C25	C26	C39	C40	4
5		CQMB223KTH		MYLAR CAPACITOR	0.022MFD	50V	-10, +10%	C73	C74	C75	C76	5
								C81				
4		CQMB393KTH		MYLAR CAPACITOR	0.039MFD	50V	-10, +10%	C19	C20	C21	C22	4
4		CQMB472KTH		MYLAR CAPACITOR	4700PF	50V	-10, +10%	C27	C28	C41	C42	4
2		CQMB683KTH		MYLAR CAPACITOR	0.068MFD	50V	-10, +10%	C67	C68			2
2		CQMB822KTH		MYLAR CAPACITOR	8200PF	50V	-10, +10%	C23	C24			2

EXPLODED ASSEMBLY	PART NAME		PART CODE	REMARKS	P.W.B.O.A.R.D ASSY		APSTA005CD	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	PART CODE	PART STOCK NUMBER			C77	C78				C45	C46	C35	C36	
1		CQMC563KEH						MYLAR CAPACITOR		C77	C78			2
2		CQVB124JEN						MYLAR FILM CAP.		C45	C46			2
3		CQVB274JEN						MYLAR CAP.		C35	C36	C37	C38	4
4		LA3QH1323B						CHUKE COIL		L1	L2			2
5		MU242AD004						HEAT SINK		HS1	HS2	HS3	HS4	4
6		MU622AD002						HEAT SINK		HS5	HS6			2
7		MW201BS001						TERMINAL						29
8		MW401CX001						SHORT JUMPER	JW-10					5
9		MW401CX002						SHORT JUMPER						9
10		MW401CX005						SHORT JAMPER	JW-15					7
11		MW401CX006						SHOT JAMPER	10MM					46
12		MW401CX008						SHORT JUMPER						2
13		PSLA7002CX						PRINTED W.B.O.A.R.D						1
14		PSTA005C0X						PRINTED W.B.O.A.R.D						1
15		QDSEM1ZXXD						SILICON DIODE	EMIZ <SANKEN>	D1	D15	D2	D20	6
16										D3	D4			
17		QDSMA150XN						SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24PIN	D10	D11	D12	D13	11
18										D14	D21	D5	D6	
19										D7	D8	D9		
20		QDSR3AM8BE						SILICON DIODE	SR3AM-8BVRRM400VR=320VRS500VFM=1.1	D29	D30	D31	D32	4
21		QDZ130EB3A						ZENER DIODE	R013EB3 VZ=12.99-13.66V	D34				1

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART NAME		SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
	P.W.B. BOARD ASSY	APSTA005CD	PART CODE	PART STOCK NUMBER		PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	
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EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART NAME		SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
	P.W.B. BOARD ASSY	APSTA005CD	PART CODE	PART STOCK NUMBER		PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	
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EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART NAME		SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
	P.W.B. BOARD ASSY	APSTA005CD	PART CODE	PART STOCK NUMBER		PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	
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EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART NAME		SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
	P.W.B. BOARD ASSY	APSTA005CD	PART CODE	PART STOCK NUMBER		PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	PART NAME	PART STOCK NUMBER	
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EXPLODED ASSEMBLY		PART NAME		PART CODE					
		P.W.B.O.A.R.D. ASSY		APSTA005CD					
ITEM NO.	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		RG1ARJ562B		M-OXIDE FILM R.			R85	R86	2
2		RG2ARJ122B		M-OXIDE FILM R.			R186		1
3		RG2ARJ151B		M-OXIDE FILM R.			R169	R170	2
4		RG2ARJ222B		M-OXIDE FILM R.			R175	R67 R68 R69	5
5							R70		
6		RG2ARJ272B		M-OXIDE FILM R.			R188		1
7		RG2ARJ681B		M-OXIDE FILM R.			R127		1
8		RPJN833102		SEMI-FIXED VR.			RV1	RV2	2
9		RVNA503A16		VR			VR5		1
10		RVQA503B14		VR			VR2	VR3 VR4	3
11		RVUA104B03		VR			VR1		1
12		RXHARJ100B		M-OXIDE FILM R.			R117	R118 R185	3
13		RXHARJ4R7B		M-OXIDE FILM R.			R144		1
14		RX2ARJ5R6B		M-OXIDE FILM R.			R115	R116	2
15		SP04CAX13D		PUSH.SW			S1		1
16		VVL211GE90		FUSE LABEL					2
17		WP08110DHT		PC-JOINT			JU1	JU2	2
18		WUGP14EEXX		HI-WRAP WIRE			NO13	NO15	2
19		WUGP20EEXX		HI-WRAP WIRE			NO14		1
20		WUG007EEXX		HI-WRAP WIRE			NO2		1
21		WUG008EEXX		HI-WRAP WIRE			NO1		1

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W.B.O.A.R.D. ASSY		APSTA005CD						
LINE NO.	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		YHF0P0001Z		FUSE HOLDER		FH1	FH2	FH3	FH4	4
2		ZRA244102Z		RELAY		K1				1
3										
4										
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EXPLODED ASSEMBLY		PART NAME		PART CODE											
		P.W.B.O.A.R.D. ASSY		APSTA005CD											
1	REMARKS	CYBERNET PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS				SYMBOLIC OR EXPLODED VIEW NO.				QTY USED		
1		WUG015EEXX		HI-WRAP WIRE					NO8				1		
2		WUG016EEXX		HI-WRAP WIRE					NO5				1		
3		WUG021EEXX		HI-WRAP WIRE					NO7				1		
4		WUG024EEXX		HI-WRAP WIRE					NO3				1		
5		WUG034EEXX		HI-WRAP WIRE					NO4				1		
6		WUG036EEXX		HI-WRAP. WIRE					NO6				1		
7		WUG043EKXX		HI-WRAP WIRE					NO27				1		
8		WUG121EEXX		HI-WRAP WIRE					NO9				1		
9		WUG215EEXX		HI-WRAP WIRE					NO10				1		
10		WUG220EEXX		HI-WRAP WIRE					NO21				1		
11		WUG323EEXX		HI-WRAP. WIRE					NO23				1		
12		WUG341EKXX		HI-WRAP WIRE					NO25				1		
13		WUG429EEXX		HI-WRAP WIRE					NO24				1		
14		WUG446EKXX		HI-WRAP WIRE					NO26				1		
15		WUG527EEXX		HI-WRAP WIRE					NO18				1		
16		WUG629EEXX		HI-WRAP WIRE					NO19				1		
17		WUG711EEXX		HI-WRAP WIRE					NO11				1		
18		WUG716EEXX		HI-WRAP WIRE					NO20				1		
19		WUG823EEXX		HI-WRAP WIRE					NO12				1		
20		WUG919EEXX		HI-WRAP WIRE					NO22				1		
21		WUG931EEXX		HI-WRAP WIRE					NO16	NO17			2		

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W.B.O.A.R.D. ASSY		AP5ZQ013AD						
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		CEVH010ALX		ELYT. CAPACITOR		C1	C2			2
2		MW201BS001		TERMINAL						2
3		MW401CX001		SHORT JUMPER	JW-10					1
4		MW401CX006		SHOT JAMPER	10MM					2
5		PSZQ013C0X		PRINTED W.B.O.A.R.D.						1
6		RF03WKR22B		WIRE WOUND R.		R1				1
7		WUGP44EKXX		HI-WRAP WIRE		NO1				1
8		WUG116EEXX		HI-WRAP WIRE		NO3				1
9		WUG939EKXX		HI-WRAP WIRE		NO2				1
10										
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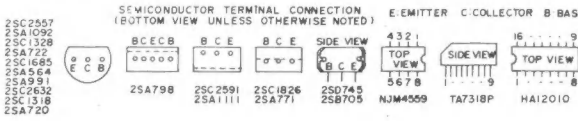
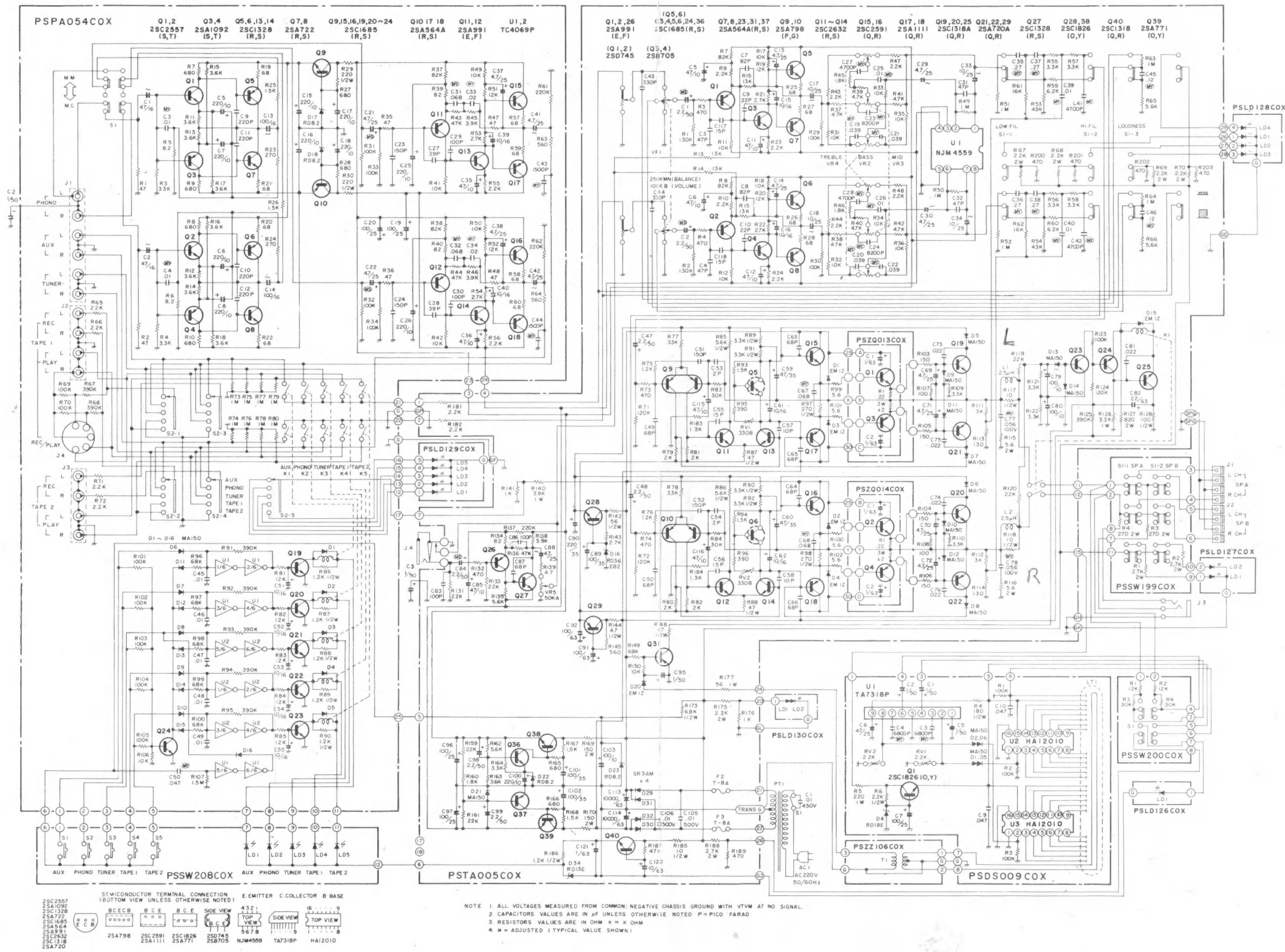


NOTE.

EXPLODED ASSEMBLY		PART NAME P.W.B.O.A.R.D. ASSY		PART CODE APSZQ014AD					
ITEM	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			QTY USED
1		CEVH010ALX		ELYT. CAPACITOR		C1	C2		2
2		MW201BS001		TERMINAL					2
3		MW401CX001		SHORT JUMPER	JW-10				1
4		MW401CX006		SHOT JAMPER	10MM				2
5		PSZQ014C0X		PRINTED W.B.O.A.R.D.					1
6		RF03WKR22B		WIRE WOUND R.		R1			1
7		WUGP51EKXX		HI-WRAP WIRE		N01			1
8		WUG216EEXX		HI-WRAP WIRE		N03			1
9		WUG525EEXX		HI-WRAP WIRE		N04			1
10		WUG947EKXX		HI-WRAP WIRE		N02			1
11									
12									
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19									
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EXPLODED ASSEMBLY		PART NAME		PART CODE						
		P.W. BOARD ASSY	APSZZ106AA							
QTY IN	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		MW201BS001		TERMINAL						2
2		PSZZ106C0X		PRINTED W. BOARD						1
3		THG24B001W		HEATER TRANS.						1
4										
5										
6										
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Schematic Diagram



NOTE 1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE CHASSIS GROUND WITH VTVM AT NO SIGNAL.  
2. CAPACITOR VALUES ARE IN  $\mu$ F UNLESS OTHERWISE NOTED P=PICO FARAD  
3. RESISTOR VALUES ARE IN OHM K=K OHM  
4. \* = ADJUSTED (TYPICAL VALUE SHOWN)

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